

1 **Prevalence and general characteristics of dementia: a nationwide population-based**
2 **study of electronic health records in Türkiye**

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1 **Informed Consent:**

2 The study corresponds to the ethical norms and standards in the Declaration of
3 Helsinki. The Ministry of Health's Ethical Board Committee approved the study
4 protocol (IRB number: 95741342-020 on the date of. 27.11.2019).

5

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4

Abstract

5 **Background/aim:** Türkiye is a country with an increasing life expectancy and an older
6 adult population in parallel with the rest of the world. Several national small-scale studies
7 were performed regarding the prevalence and characteristics of dementia in Türkiye, and
8 the results of these studies differ from each other. We aimed to determine the prevalence
9 of dementia in Türkiye, to present the demographic characteristics, the frequency of use
10 of health services, and the management of dementia.

11 **Materials and methods:** Patients with a diagnosis of any type of dementia aged 65 years
12 old between 01 January 2019 and 31 December 2020 were screened retrospectively from
13 the electronic health records of the Ministry of Health by using the ICD-10 codes.

14 **Results:** The total number of dementia cases identified aged 65 years and older was 247
15 727, of whom 150 529 (60.8%) were women. The rate of patients admitted to the
16 emergency department was 72.3% and 66.2% of all dementia patients in 2019 and 2020,
17 respectively. In terms of the use of outpatient clinics, it was observed that most of the
18 patients with dementia (71.0% in 2019 and 62.4% in 2020) were admitted to Neurology.
19 The outpatient clinic of geriatric medicine was the least-used clinic for patients with
20 dementia both in 2019 and 2020.

21 **Conclusion:** Patients living with dementia were less in Türkiye than in the world
22 prevalence. This finding supports that most dementia cases are overlooked. This situation
23 highlights the need to increase dementia awareness both in the community and in primary
24 health care providers who frequently encounter older individuals. The study is of great

1 importance in that it is the first study to show the nationwide frequency of dementia in
2 Türkiye.

3 **Key words:** Dementia, prevalence, geriatrics

4

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8 protocol (IRB number: 95741342-020 on the date of. 27.11.2019).

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10

1 **1. Introduction**

2 Dementia is a chronic and progressive clinical syndrome causing impairment in cognitive
3 functions beyond age-related changes according to the definition by the World Health
4 Organization (WHO)*. The key features of dementia are the cognitive impairment
5 affecting the daily activities, social life, and occupation of the patient, due to the loss of
6 previously acquired skills. There may be certain levels of mood and behavioral changes,
7 psychiatric symptoms, and motor disorders accompanying impairments in cognitive
8 functions [1,2]. With the expansion of the older population all over the world, the number
9 of people living with dementia is also increasing. It is thought that 50 million people
10 worldwide are diagnosed with dementia and 10 million new cases are added to this
11 number each year[†]. The fact that dementia has become an important problem for the
12 health policies of societies has increased the importance of identifying modifiable causes
13 as well as non-modifiable causes. Approximately 40% of dementia cases are theoretically
14 preventable [3]. The most common cause of dementia is Alzheimer's disease which is
15 responsible for 60 to 70% of dementia cases. According to WHO, deaths due to
16 Alzheimer's disease and dementia have risen to the seventh rank among all-cause deaths*.
17 Furthermore, mortality due to dementia doubled between 2000 and 2019. In addition, the
18 total global cost of dementia in terms of health expenditures is estimated to be \$1.3 trillion
19 as of 2019*.

* World Health Organization. Dementia [online] Website <https://www.who.int/news-room/fact-sheets/detail/dementia>. [Accessed 23 October 2022]

[†] World Health Organization. Dementia, Prevalence [online] Website https://www.who.int/health-topics/dementia#tab=tab_2 [Accessed 23 October 2022]

1 Türkiye is a country with an increasing life expectancy and older adult population in
2 parallel with the rest of the world. The population aged 65 and over in Türkiye has
3 increased by 22.5% in the last five years and reached 7 million 953 thousand 555 people
4 in 2020. On the other hand, the proportion of the older adult population in the total
5 population was 8.2% in 2015, it increased to 9.5% in 2020*. In 2021 the population aged
6 65 and over became 8 million 245 thousand 124, and it increased to 9.74%†. In two
7 separate studies conducted in Istanbul and Izmir at 2008 and 2006, respectively, the
8 prevalence of Alzheimer's disease was found to be 20% and 22.9%, respectively [4,5].
9 According to the data published in 2008 of Hacettepe University Faculty of Medicine,
10 Alzheimer's disease was observed in 8.2% of 1255 patients over the age of 65 who applied
11 to the geriatrics outpatient clinic [6]. In another study conducted at 2008 on Hacettepe
12 University, the frequency of Alzheimer's disease was 14.1% and the frequency of vascular
13 dementia was 3.8% [7]. In another study conducted in Ankara the frequency of dementia
14 was found to be 13.7% in 2010 [8]. In a recent study published in 2021 with 500 people
15 in the Sivas region, the frequency of dementia was found to be 16.8% and the frequency
16 of dementia was associated with older age, female gender, marital status, and educational
17 status [9]. In another study conducted with a relatively small number of patients in
18 Eskişehir in 2009, the prevalence of dementia was found to be 8.4%, while age-specific
19 prevalences were 2.2% for 55-59 years old, 5.3% for 60-64 years old and It was found to
20 be 30.4% over 75 years old [10]. In another study conducted in 2014 with 555 geriatric
21 female patients, the frequency of dementia was found to be 39.4% [11]. All these data are
22 from national small-scale studies with different timelines, and there is not enough data

* Türkiye İstatistik Kurumu. İstatistiklerle Yaşlılar, 2020 [online] Website <https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Yaslilar-2020-37227> [Accessed 23 May 2022]

† Türkiye İstatistik Kurumu. İstatistiklerle Yaşlılar, 2021 [online] Website <https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Yaslilar-2021-45636> [Accessed 23 May 2022]

1 specific to age groups, and the results of these studies differ from each other. Therefore,
2 knowing the frequency and characteristics of national dementia stands out as a basic and
3 priority step for the development of dementia management and national health policies.
4 In light of all this information, this study aims to determine the prevalence of dementia
5 aged 65 and over in Türkiye as a developing country, to present the demographic
6 characteristics of patients with dementia, the frequency of use of health services, and
7 management of this geriatric syndrome.

8 **2. Material and methods**

9 **2.1. Study population and data collection**

10 Patients with a diagnosis of any type of dementia aged 65 years old between 01 January
11 2019 and 31 December 2020 were screened retrospectively. E-nabız is an information
12 system designed by the Turkish Ministry of Health, and it has been used since 2015 by
13 every healthcare facility in Türkiye. In 2019, 7 million 610 thousand 144 people and in
14 2020 7 million 979 thousand 559 people were registered in e-nabız. Anyone who applies
15 to any health institution has a record on e-nabız, therefore with a treatment report and/or
16 at least one prescription diagnosed with dementia nationwide was screened. The presence
17 of dementia was identified based on the database with the International Classification of
18 Diseases and Injuries-10 (ICD-10) diagnostic codes. Geriatric syndromes including
19 malnutrition, osteoporosis, hip fracture history, incontinence, and depression were also
20 determined by ICD-10 diagnostic codes (F00 and subdivisions, F01 and its subdivisions,
21 F02 and its subdivisions, F03, G30 and its subdivisions, G31, F32-34 and their
22 subdivisions, F38 and its subdivisions, F39, N31 and subdivisions, N39.3, N39.4, R32,
23 M80-82 and their subdivisions, S72 and its subdivisions, E43, E44 and subdivisions, E64
24 and its subdivisions, Z93 and its subdivisions). The database was double-checked to avoid

1 repetitive data. Epidemiological data, medical features and treatment choices, admission
2 to healthcare facilities, and mortality status were obtained from the Turkish Ministry of
3 Health Database, e-nabız. This study was carried out in accordance with the permission
4 of the Turkish Ministry of Health.

5 **2.2. Statistical analysis**

6 SPSS for Windows v.23.0 (SPSS Inc., Chicago, IL) was used for the statistical analyses.
7 Variables were examined using visual and analytical methods to determine whether they
8 were normally distributed. Categorical variables were shown as numbers and frequencies.
9 Continuous data that followed a normal distribution were described with mean \pm standard
10 deviation (SD). When distributions were not normal, the data were described with median
11 [Quartile 1-Quartile 3]. A 5% type I error level was used to infer statistical significance.

12

13 **3. Results**

14 The study population is the entire Turkish population aged ≥ 65 years with a diagnosis of
15 dementia in the respective two years (2019-2020). From 1 January 2019 to 31 December
16 2019, the total number of dementia cases identified aged 65 years and older was 247 727,
17 of whom 150 529 (60.8%) were women (Table 1). Between 1 January 2020 and 31
18 December 2020, the total number of patients diagnosed with dementia aged 65 years and
19 older was 233 949 of whom 142 878 (61.1%) were women. The prevalence of dementia,
20 which was presented per thousand, in 2019 was 33‰ whereas it was 29‰ in 2020. The
21 median age of patients with dementia in the geriatric population was 79.0 [73-85], in 2019
22 and 80.0 [74-86] in 2020. The frequency of dementia was 100.0‰ in patients aged 85
23 years and older in 2019 and 2020. Whereas between the aged of 75-84 years the frequency
24 of dementia was 49‰ in 2019, and 45‰ in 2020. In the 65-74 age group, the frequency

1 of dementia was observed as 16% in 2019 and 13% in 2020. Table 1 shows the
2 prevalence of dementia in the geriatric population in Türkiye by years.

3 The median number of use of healthcare facilities in patients with dementia was 40 [27-
4 59] in 2019 and it was 31[20-46] in 2020. The rate of patients admitted to the emergency
5 department was 72.3% and 66.2% of all dementia patients in 2019 and 2020, respectively.

6 In 2019, 15 720 (6.3%) patients diagnosed with dementia were hospitalized in the
7 intensive care unit (ICU) and 142 041 (57.3%) patients were hospitalized in other wards.

8 The median length of stay in the hospital was 13 [6-28] days in 2019. In addition, in 2020
9 8.0% of all dementia patients were hospitalized in ICU and 49.2% of the whole population
10 was hospitalized in other wards. The median length of stay in the hospital was 10 [4-20]

11 days in 2020. The rate of patients with dementia followed by homecare services was 5.5%
12 and 7.5% in 2019 and in 2020, respectively. In terms of the use of outpatient clinics, it

13 was observed that most of the patients with dementia (71.0% in 2019 and 62.4% in 2020)
14 were admitted to Neurology. The outpatient clinic of geriatric medicine was the least-

15 used clinic for patients with dementia both in 2019 and 2020. The use of healthcare
16 facilities in patients diagnosed with dementia in the geriatric population in Türkiye is

17 shown in Table 2.

18 The most frequently observed chronic condition in patients with dementia was
19 hypertension followed by atherosclerotic heart disease, diabetes mellitus, and

20 cerebrovascular diseases, respectively (Table 3). Regarding geriatric syndromes,
21 depression was the most commonly encountered condition in patients living with

22 dementia in both two years (54.4% and 53.7%, respectively). In 2019, 13.6% of the
23 whole population had osteoporosis and 2.2% of patients with dementia experienced femur

24 fractures. In 2020 9.5% of the patients living with dementia had osteoporosis and 2.1%

1 of whole patients experienced femur fractures. The malnutrition rate was 5.9% in 2019
2 and 7.3% in 2020. The frequency of urinary incontinence was 7.7% in 2019 and 5.6% of
3 patients had urinary incontinence in 2020 (Table 3).

4 The mostly prescribed anti-dementia medication was donepezil. The donepezil
5 prescription rate was 16.6% in 2019 and it was 9.4% in 2020. N-methyl-D-aspartate
6 (NMDA) antagonist, memantine was secondly prescribed medication for dementia, 9.3%
7 of all dementia patients in 2019 were given this medication. In 2020 4.4% of patients with
8 dementia were treated with memantine. The use of combination therapy rates was 7.3%
9 and 3.2% in 2019 and 2020, respectively. While the use typical antipsychotic rate was
10 5.8% in 2019, it was 6.5% (n=15 329) in 2020. The most commonly used first-generation
11 antipsychotic was haloperidol (5.1% in 2019 and 5.9% in 2020). The most frequently
12 used second-generation antipsychotics were quetiapine (18.5% in 2019 and 22.0% in
13 2020), olanzapine (4.9% in 2019 and 5.7% in 2020) and risperidone (2.6% in 2019 and
14 2.6% in 2020), respectively. Treatment choices for osteoporosis were bisphosphonates,
15 denosumab, and teriparatide, respectively in both 2019 and 2020. Antibiotics were
16 prescribed to 60.4% of all patients in 2019 and 49.6% in 2020. The use of analgesics was
17 53.9% in 2019 and 48.1% in 2020. Prescription-based medication use in patients
18 diagnosed with dementia in the geriatric population in Türkiye was summarized in Table
19 4.

20 **4. Discussion**

21 As in the whole world, the population aged 65 years and over is increasing in our country,
22 and the frequency of dementia has risen as the geriatric population increases. Our study
23 is essential since the prevalence of patients who have been diagnosed with dementia in
24 the last 2 years in Türkiye was shown firstly. It has been observed that in our developing

1 country, fewer dementia diagnoses are made than the world prevalence. This finding
2 supports that most dementia cases are overlooked. This situation highlights the need to
3 increase dementia awareness both in the community and in primary health care providers
4 who frequently encounter older individuals. The study is of great importance in that it is
5 the first study to show the nationwide prevalence of dementia in Türkiye.

6 A relative decrease in the frequency of dementia was observed in 2020. The reason for
7 this decrease can be considered as the decrease in elective hospital admissions due to the
8 Coronavirus Disease 2019 (COVID-19) pandemic. The fact that the group with the most
9 severe course of COVID-19 is older adults and deaths are more common in this
10 population can be counted as the restrictions introduced to protect older adults from the
11 negative health consequences of the pandemic.

12 Dementia cases were more commonly observed in women Türkiye, as the rest of the
13 world. Among the reasons for the higher frequency of dementia in women are the higher
14 probability of being diagnosed with dementia due to the fact that women have a longer
15 life expectancy and a low level of education in Türkiye.

16 Studies identify that the utilization of healthcare services by patients with dementia is in
17 large part due to increased hospitalization; other studies report that patients with dementia
18 receive more hospital admission and aggressive interventions than patients without
19 dementia near the end of life. It was suggested that patients with dementia have a higher
20 frequency of hospitalizations and emergency department visits than patients without
21 dementia. A nationwide study from Taiwan investigating the healthcare utilization of
22 patients with dementia also revealed that 84.9% of patients with dementia were admitted
23 to emergency services and 83.6% of patients with dementia were hospitalized. The
24 median length of stay per admission was 8.6 days per admission [12]. A retrospective

1 cohort study from the USA, 78.5% of all hospitalizations received emergency department
2 care. The mean length of stay in the hospital ranged between 5.9-6.1 days from 2012 to
3 2016. 84.1% of emergency department hospitalizations and 4.4% of elective
4 hospitalizations were caused by preventable conditions [13]. The emergency department
5 was the most utilized healthcare service by patients with dementia in Türkiye, in 2019
6 72.3% of people with dementia and 66.2% of people with dementia were applied to the
7 emergency department. Another striking finding of our study was that the rates of anti-
8 dementia drug use or compliance of the treatment of the patients included in the study
9 were quite low. The low rate of medication use in patients diagnosed with dementia can
10 be attributed to several factors, including limited efficacy of anti-dementia medications,
11 discontinuation of medications due to some adverse effects such as gastrointestinal side
12 effects, problems of adherence the treatment and polypharmacy and inappropriate drug
13 use in older people.

14 Geriatric syndromes are frequently accompanied by dementia including malnutrition,
15 depression, and urinary incontinence. In a study conducted by a university hospital in
16 Türkiye, 253 patients with Alzheimer's Disease were included, malnutrition was
17 observed at 25.3%, and malnutrition risk was found in 39.5% of the entire study
18 population [14]. Nevertheless, the malnutrition rate was 5.9% in 2019 and 7.3% in 2020
19 according to the current study, which is far beyond the previous results. This difference
20 shows that malnutrition is overlooked and emphasizes the importance of comprehensive
21 geriatric evaluation in patients with dementia, however, in Türkiye, only one in ten
22 patients with dementia was evaluated by a geriatrician. Physicians' awareness and ability
23 to address geriatric syndromes may differ, impacting their likelihood of recognizing and
24 documenting these conditions in clinical practice. Furthermore, differences in

1 documentation practices among healthcare facilities can also influence the completeness
2 and accuracy of medical records. If symptoms or conditions related to malnutrition or
3 other geriatric syndromes are inconsistently documented, they may be missed during data
4 collection and analysis.

5 Another common problem in patients with dementia is urinary incontinence. It is
6 estimated that nearly half of the patients with dementia experience incontinence
7 according to a study from the United Kingdom [15]. A systematic review stated that the
8 prevalence of incontinence in patients with dementia was observed between 11-90%,
9 furthermore, it is a more commonly encountered problem in nursing homes, and the
10 prevalence of urinary incontinence in nursing homes or hospitals was 74%, compared to
11 32% among community-dwelling older adults with dementia [16]. On the other hand, in
12 Türkiye, only 5.6-7.7% of all patients with dementia had urinary incontinence which is
13 less than expected. The authors thought that the unregistered use of absorbent products
14 for incontinence could be the reason for the low incidence. Another neglected problem
15 was osteoporosis in accordance with our results. Osteoporosis often co-occurs with
16 dementia, as both disorders are strongly related to old age and dementia has been
17 associated with an increased risk of falls and hip fractures. Thus, dementia patients are at
18 increased risk of fracture and potentially at increased risk of mortality should they sustain
19 a fracture [17]. In a study from Sweden conducted on 305 dementia patients, any type of
20 osteoporotic fracture was seen in 25.4% and hip fracture was found in 16% of patients
21 with dementia, which is higher than our results. In the previous study 5.4 % of patients
22 were treated with osteoporosis drugs, none of them bisphosphonates [18]. In contrast,
23 bisphosphonates were the drug of choice for osteoporosis in Türkiye.

1 Besides being a risk factor and a prodrome of dementia, depression is another geriatric
2 syndrome commonly accompanied by dementia. Although it is difficult to distinguish
3 depression from cognitive impairment, it is not easy to recognize depression in people
4 with dementia [19]. The prevalence varies across the studies since different diagnostic
5 criteria and study populations among the previous studies, it is estimated that nearly 30%
6 of patients with dementia had depression [20]. In our study, the depression rate was found
7 higher than in previous studies.

8 The geriatric assessment aids in diagnosing medical conditions; developing treatment and
9 follow-up plans; coordinating of management, and evaluating long-term care needs and
10 optimal placement. The geriatric assessment differs from a standard medical evaluation
11 by including nonmedical domains; emphasizing functional capacity and quality of life;
12 and, often, incorporating a multidisciplinary team. It usually yields a more complete and
13 relevant list of medical, functional, and psychosocial problems [21].

14 Cholinesterase inhibitors have a minor effect in enhancing cognition and activities of
15 daily living in patients with mild-to-moderate Alzheimer's disease [22] and they are also
16 indicated in severe Alzheimer's disease, and memantine can be used in addition or
17 independently for patients with moderate to severe Alzheimer's disease [23]. In our study,
18 the rate of patients treated with anti-dementia medications was depleted, the reason for
19 this condition was thought that related to COVID-19 pandemic. With the decision by the
20 Ministry of Health of the Republic of Türkiye, it is planned to take drugs without
21 prescription so that the treatment of the patients is not interrupted within the scope of the
22 pandemic policy. Anti-dementia treatments seem lower than expected due to medications
23 that are not reflected in the prescription and are unregistered.

1 Pain is a prevalent symptom affecting 32-64% of community-dwelling people living with
2 dementia. These people experience acute and chronic pain from frequent causes, and
3 some have neuropathic or nociceptive pain. In a study from Türkiye it was revealed that
4 48.7% of patients with early-stage of dementia, 22.2% and 27.3% of patients with
5 moderate-stage and severe-stage of dementia declared pain [1]. Whatever the cause it
6 requires thorough assessment and management to ensure the appropriate type and dosage
7 of analgesia is provided. It was revealed that analgesics were used by 34.9% of persons
8 with dementia according to a study conducted on 67 215 participants with dementia [24].
9 In contrast, another study stated that people with dementia had a consistently lower
10 prevalence and odds of analgesic prescription compared with people without dementia
11 [25]. In line with our results, one in every two patients was treated with analgesics,
12 unfortunately, the type o analgesics was unknown. Recent reports from observational
13 studies have indicated that the overall use of analgesics in people with dementia is
14 increasing, most markedly for opioid analgesics however paracetamol is the first-line and
15 the safest treatment for pain in patients with dementia [26].

16 Antipsychotic medicines are commonly used to treat behavioral and psychiatric
17 symptoms of dementia. The use of antipsychotics in patients with dementia is
18 recommended by American Psychiatric Association in case of dangerous agitation and
19 psychosis since antipsychotics can minimize the risk of violence, reduce patient distress,
20 improve the patient's quality of life, and reduce caregiver burden [27]. According to a
21 meta-epidemiological study, conventional antipsychotics had a small effect on agitation
22 in dementia however the difference was insignificant. On the other hand, conventional
23 antipsychotics had a small treatment effect on psychosis in patients with dementia.
24 Atypical antipsychotics had a minimal but statistically insignificant effect on agitation

1 and a negligible statistically significant effect on psychosis [28]. A nationwide study from
2 Denmark yielded that antipsychotics increased the mortality risk so it should be given
3 with caution [29]. Mueller et al. revealed in their study only 11.0% of the whole study
4 population has been prescribed any type of antipsychotics and the use of antipsychotics
5 was associated with increased stroke and mortality risk [30]. FDA published a black-box
6 warning about antipsychotics since associated with increased rates of stroke and death in
7 older adults with dementia [1]. According to our nationwide data, atypical antipsychotics
8 were preferred over typical antipsychotics, nearly one in every three patients with
9 dementia was treated with atypical antipsychotics. However, the indication and effect of
10 antipsychotics and adverse events related to treatment were not included in our study.

11 Infections are common in people with dementia, and the use of antibiotics is common,
12 although heterogeneous, within healthcare settings and countries. The most commonly
13 seen infections in patients with dementia include respiratory tract infections, urinary tract
14 infections, and skin and soft tissue infections. Since the atypical presentation of infections
15 and limited communication of their symptoms as cognitive function declines, these
16 individuals experience a delay in recognizing of infection and increase risk of mortality,
17 both in general and due to an infection. The rate of antibiotic use was reported to be 52%
18 according to a narrative review [31]. Similar to this review, even though antibiotic
19 prescription differs between countries and severity, in Türkiye half of the patients with
20 dementia were treated with antibiotics.

21 There were some limitations of the present study. Since data for the study were drawn
22 from the ICD-10 diagnostic codes, the type and stage of dementia could not be obtained.
23 Another important limitation is the lack of data on the causes of hospitalization and causes
24 of death. Furthermore, we acknowledged that while our study provides valuable insights

1 into the characteristic features of dementia patients, it may not delve deeply into the
2 nuances surrounding the pathogenesis, diagnosis, and prognosis of the disease which is
3 another limitation. However, our primary aim was to highlight demographic
4 characteristics and trends within the overall Türkiye's older population. It is of great
5 importance as it is the first study to evaluate dementia data nationwide.

6 In conclusion, it is striking that geriatric syndromes increasing mortality and morbidities
7 such as malnutrition, urinary incontinence, and osteoporosis, are mostly overlooked.
8 Since dementia has been started to be evaluated as a public health problem by the World
9 Health Organization, it is necessary to raise awareness of this health problem, especially
10 among primary care and emergency physicians. As a result of the comprehensive
11 assessment by the geriatrician, the quality of life of the patients and their caregivers may
12 increase and morbidity and mortality may decrease. Referral of patients with dementia to
13 a geriatrician and homecare services as needed is essential.

14

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18

19 **Author Contributions**

20 M.G., M.K., A.D., M.E., C.B., M.C., B.B.D., and N.A. were involved in the
21 conceptualization and methodology of the study. M.G., M.K., N.A., O.C., M.O.A., M.C.,
22 and S.B. were responsible for the data download and verification. M.G., M.K., S.C., and
23 A.O.B. performed the formal analysis and investigation. M.E., C.B., M.C., N.A., M.M.U,

1 G.G.U, B.B.D, and S.B. critically reviewed and edited the first draft. All the authors were
2 involved in the writing of the manuscript.

3

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3 **Table 1.** Prevalence of dementia in the geriatric population in Türkiye by years

	2019		2020	
	n (%)	Prevalence	n (%)	Prevalence
Total	247 727 (100)	33‰	233 949 (100)	29‰
Sex				
Women	150 529 (60.8)	36‰	142 878 (61.1)	32‰
Men	97 198 (39.2)	29‰	91 071 (38.9)	26‰
Age Groups				
65-74 years	73 749 (29.8)	16‰	66 146 (28.3)	13‰
75-84 years	105 482 (42.6)	49‰	100 949 (43.2)	45‰
≥ 85 years	68 496 (27.6)	100‰	66 854 (28.6)	100‰

4 The prevalence of dementia was presented per thousand.

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2 **Table 2.** Use of healthcare facilities in patients diagnosed with dementia in the geriatric
3 population in Türkiye

4 **Variables given as n(%) or median [25th-75th].*

	2019	2020
Use of healthcare facilities per patient	40 [27-59]	31 [20-46]
Patients Admitted Emergency Department	179 134 (72.3)	154 853 (66.2)
Patients Hospitalized in ICU	15 720 (6.3)	18 689 (8.0)
The length of stay in ICU, days	5 [2-9]	5 [2-10]
Patients hospitalized in other wards	142 041 (57.3)	115 092 (49.2)
The length of stay in hospital, days	13 [6-28]	10 [4-20]
Patients followed by Homecare Services	13 703 (5.5)	17 553 (7.5)
Patients admitted to Internal Medicine Clinics	165 546 (66.8)	119 407 (51.0)
Patients admitted to Geriatric Medicine Clinics	4129 (1.7)	3294 (1.4)
Patients admitted to Neurology Clinics	175 769 (71.0)	145 944 (62.4)
Patients admitted to Psychiatry Clinics	86 972 (35.1)	67 402 (28.8)
Deceased	101 959 (41.2)	84 385 (36.1)

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1 **Table 3.** Chronic diseases, geriatric syndromes, and mortality in the geriatric population
 2 diagnosed with dementia in Türkiye
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	2019	2020
<i>Chronic Diseases</i>	n (%)	n (%)
Hypertension	195 154 (78.8)	174 013 (74.4)
Atherosclerotic heart disease	92 222 (37.2)	71 873 (30.7)
Diabetes mellitus	83 754 (33.8)	72 084 (30.8)
Cerebrovascular Disease	75 654 (30.5)	64 192 (27.4)
Hyperlipidemia	54 364 (21.9)	40 604 (17.4)
Chronic Obstructive Pulmonary Disease/Asthma	73 311 (29.6)	56 325 (24.1)
Malignancy	14846 (6.0)	12 678 (5.4)
Non-hematological	13 831 (5.6)	11 763 (5.0)
Hematological	1 317 (0.5)	1 159 (0.5)
Atrial Fibrillation	31 366 (12.7)	25 923 (11.1)
Chronic Heart Failure	25 453 (10.3)	20 661 (8.8)
Chronic Renal Disease	16 156 (6.5)	13 474 (5.8)
<i>Geriatric Syndromes</i>		
Malnutrition	14 724 (5.9)	17 100 (7.3)
Depression	134 772 (54.4)	125 527 (53.7)
Osteoporosis	33 811 (13.6)	22 213 (9.5)
Hip Fractures	5543 (2.2)	4900 (2.1)
Urinary Incontinence	18 997 (7.7)	13 059 (5.6)

1 **Table 4.** Prescription-based medication use in patients diagnosed with dementia in the
 2 geriatric population in Türkiye

	2019	2020
	n(%)	n(%)
Anti-dementia Drugs		
Donepezil	41 109 (16.6)	22 006 (9.4)
Rivastigmine	16 214 (6.5)	7 200 (3.1)
Galantamine	14 (0.01)	9 (0.005)
Memantine	23 161 (9.3)	10 323 (4.4)
Combination of Donepezil and Memantine	18 054 (7.3)	7515 (3.2)
Gingko Biloba	31 727 (12.8)	16 094 (6.9)
Anti-psychotic Drugs		
Typical	14 438 (5.8)	15 329 (6.5)
Haloperidol	12 594 (5.1)	13 874 (5.9)
Atypical	71 522 (28.9)	76 535 (32.7)
Quetiapine	45 855 (18.5)	51 356 (22.0)
Olanzapine	12 168 (4.9)	13 349 (5.7)
Risperidone	6368 (2.6)	6075 (2.6)
Aripiprazole	4705 (1.9)	3756 (1.6)
Osteoporosis Treatment		
Bisphosphonates	16 320 (6.6)	9034 (3.9)
Denosumab	2690 (1.1)	1600 (0.7)
Teriparatide	172 (0.1)	102 (0.1)

Antibiotics	149 702 (60.4)	116 115 (49.6)
Analgesics	133 418 (53.9)	112 543 (48.1)

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